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S. 39

PN - JP9121853 A 19970513  
PD - 1997-05-13  
PR - JP19960244364 19960917  
OPD - 1996-09-17  
TI - GALACTANASE S-39 AND BACILLUS SP S39 CAPABLE OF  
PRODUCING THE SAME  
IN - AKIBA AKIHIKO; HORIKOSHI KOKI; TSUMURA KAZUNOBU  
PA - FUJI OIL CO LTD  
IC - C12N9/42 ; C12N1/20 ; C12P19/14

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- TI - Galactanase S-39 produced by Bacillus sp. S-39 - acts on soybean fibre to give Galacto-oligosaccharide
- PR - JP19900040627 19900220; JP19960244364 19900220
- PN - JP9121853 A 19970513 DW199729 C12N9/42 007pp  
- JP2894293B2 B2 19990524 DW199926 C12N9/42 007pp
- PA - (FUKO ) FUJI SEIYU KK
- C - C12N9/42 C12R1/07 ;  
- C12N1/20 C12R1/07
- IC - C12N1/20 ; C12N9/42 ; C12P19/14
- AB - J09121853 Galactanase S-39 acts on soybean fibre to give galacto-oligosaccharide without forming monosaccharide, galactose; acts on substrate, beta-1,4-galactan without acting on beta-1,3-galactan; at pH 3-12, at temperature 20-65 degrees C, has optimal pH 4.0, is stable at pH 4-10.5, and stable at less than 6 degrees C, and has molecular weight of about 36,000.
- Galactanase producing Bacillus sp. S-39 (FERM P-11230) having following bacteriological properties (1) negative in denitrification reaction, (2) positive in gas generation from glucose, (3) negative in Koser medium in utilisation of citric acid, (4) grows in pH range of 6.8 or higher, (5) negative in anaerobic culture, (6) positive in VP test, (7) positive in casein hydrolysis, (8) negative in reduction of nitrate, and (9) no growth under 5-10% NaCl concentration.
  - Bacillus sp. S-39 is aerobically cultured in nutrient media and produced galacto-oligosaccharide can be isolated and purified by conventional methods.
  - ADVANTAGE - Selective production of galacto-oligosaccharide without forming galactose.
  - Bacillus sp. S-39 was inoculated in a liquid medium and cultured with shaking at 37 degrees C for 40 days. The cultured mixture was

centrifuged to give supernatant containing galactanase S-39 and purified with HPLC. The resultant galactanase S-39 was caused to react on a substrate at pH4.0 for 6 hours to give galacto-oligosaccharides with a yield of 46%. HPLC analysis of the product showed galactobiose 28%, galactotriose 54%, galactotetraose 15%, and galactopentaose 3% without galactose. (Dwg.1/5)

OPD - 1990-02-20

AN - 1997-314217 [29]

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AB - PROBLEM TO BE SOLVED: To obtain a new galactanase virtually incapable of producing monosaccharides (e.g. galactose) even after hydrolyzing dietary fibers and capable of producing oligosaccharides (e.g. galactooligosaccharide) in high yield, and to obtain a new microorganism capable of producing the above galactanase.

- SOLUTION: This new galactanase, galactanase S39, has the following enzymatic characteristics: (a) action: acting on soybean fibers to produce galactooligosaccharide but nearly not isolating monosaccharides (e.g. galactose); (b) substrate specificity: acting on &beta;-1,4 galactan but not acting on &beta;-1,3 galactan; (c) acting pH: 3-12; and (d) acting temperature: 20-65 deg.C. The new microorganism, Bacillus sp. S39 (FERM P-11230), is capable of producing the above new galactanase and has the following bacterial characteristics; (a) physiological characteristics etc.: (1) negative in denitrification; (2) positive in gas generation from glucose; and (3) viable pH range: >=pH6.8; and (b) negative in anaerobic growability.

SI - C12P19/14

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- C12N1/20 C12R1/07